

Course Specifications

From the academic year 2023-2024 up to and including the academic year

Radioactivity and Radiation Dosimetry (CO01882)

Course size (nominal values; actual values may depend on programme)

Credits 6.0

Study time 180 h

Course offerings in academic year 2024-2025

Lecturers in academic year 2024-2025

Offered in the following programmes in 2024-2025

crdts offering

Teaching languages

Dutch

Keywords

Radioactivity, decay processes, artificial radiation sources, radioisotopes, transmutation, dosimetry, radiation dose

Position of the course

A basic knowledge of nuclear physics is required.

Radioactivity and radiation dosimetry are two complementary aspects of nuclear physics: in the first one, the origin, the properties and the applications of the radioactive decay of nuclei and other sources of ionizing radiation are investigated, the second one studies the consequences of this radiation and describes methods for a careful determination of the radiation dose. With this basic knowledge, various applications are discussed.

Contents

Radioactivity: General properties of radioactive decay; specific decay processes; artificial radiation sources; applications; radioisotopes; transmutation of radioactive decay.

Radiation dosimetry: basic quantities; interaction between radiation fields and matter; calculation of radiation doses; metrology.

Initial competences

A basic knowledge of nuclear physics is required.

Final competences

- 1 Concepts: to have obtained basic knowledge on the general properties of radioactive decay, specific decay processes and radiation sources, and the interaction between radiation fields and matter.
- 2 Insights:to have obtained insight in the basic mechanisms of radioactive decay, production of radiation and absorption of radiation.
- 3 Skills: to be able to calculate and measure activities and radiation doses.
- 4 Attitudes: to be convinced that radioactive substances and other radiation sources have to be handled with care.

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Seminar, Lecture

Study material

None

References

Basic Ideas and Concepts in Nuclear Physics, K. Heyde, IoP Bristol (2004), ISBN 0-7503-0535-5 Radioactivity, radionuclides, radiation, J. Magill and J. Galy, Springer Berlin (2005), ISBN 3-540-21116-0

Course content-related study coaching

On electronic appointment.

Assessment moments

end-of-term and continuous assessment

Examination methods in case of periodic assessment during the first examination period

Oral assessment, Written assessment with open-ended questions

Examination methods in case of periodic assessment during the second examination period

Oral assessment, Written assessment with open-ended questions

Examination methods in case of permanent assessment

Oral assessment, Assignment

Possibilities of retake in case of permanent assessment

examination during the second examination period is possible

Extra information on the examination methods

Periodic evaluation: written exam with oral part, closed book Permanent evaluation: evaluation of report and oral presentation. Frequency: 1 case-study or project + 1 oral presentation

Calculation of the examination mark

Periodical evaluation part Radioactivity: 35% of total Perdiocal evaluation part Dosimetry: 50% of total Permanent evaluation: 15% of total A student who does not pass for one of the parts of this course, can be declared as not passed for the complete course by the examinators.